



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,903	01/14/2005	James M. Tour	11321-P054W0US	7114
47744	7590	05/12/2008	EXAMINER	
WINSTEAD PC			HANOR, SERENA L	
WINSTEAD PC			ART UNIT	
P. O. BOX 50784			PAPER NUMBER	
DALLAS, TX 75201			1793	
			MAIL DATE	DELIVERY MODE
			05/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/521,903

Applicant(s)

TOUR ET AL.

Examiner

SERENA L. HANOR

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 10-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 10-16, 18-22, 24 and 25 is/are allowed.
- 6) ☒ Claim(s) 17 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the molecular figures represented by the numbers 6 and 7 in claims 17 and 23, respectively.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

i. Bahr et al. (Functionalization of Carbon Nanotubes by Electrochemical Reduction of Aryl Diazonium Salts: A Bucky Paper Electrode) disclose the functionalization of carbon nanotubes with an aryl diazonium salt (p. 6536 col. 2) by reacting the nanotubes at the sidewall carbon atoms with the salt (p. 6536 col. 1, p. 6541 col. 1). Single-wall carbon nanotubes with a diameter of 0.7 nm are used (p. 6537 col. 1). The carbon nanotubes are reacted with the organic functionalizing agent by mixing (p. 6537 col. 2).

Bahr et al. differs from the instant invention in that the carbon nanotubes are mixed with the aryl diazonium salt, which is in an acetonitrile solution. In other words, the reaction does not occur in the absence of a solvent.

ii. Haddon et al. (U.S. Patent No. 6,187,823 B1) disclose a method for functionalizing single-walled carbon nanotubes (col. 1 lines 63-67) with an organic functionalizing agent such as 4-pentylaniline, 4-tetradecylaniline, or 4-pentacosylaniline in the absence of a solvent (col. 2 lines 20-36). The diameter of the nanotubes is 0.5-100 nm, which falls within the instantly claimed range of 0.7-2.0 nm of claim 6 (col. 2 lines 45-49). Haddon et al. does not disclose the sidewall functionalization of said nanotubes.

iii. Tanaka et al. (Mechanochemical Arylation and Alkylation of Fullerene C₆₀ Under the Solvent Free Conditions) disclose the functionalization of fullerenes with an organic functionalizing agent in the absence of a solvent (p. 4397). Aryl or alkyl bromide may be employed as aryl or alkyl radical functionalizing agents (p. 4398 line 3). The step of reacting comprises mixing the fullerenes with the organic functionalizing agent in mechanical operations such as ball milling and shaking (p. 4398 lines 4-6). Tanaka et al. does not disclose the use of carbon nanotubes, which may or may not be a fullerene, or the sidewall functionalization of said fullerenes.

Response to Arguments

Applicant's arguments, see Remarks (p. 1-4), filed 02/27/2008, with respect to the Claim Objections, the Double Patenting rejections (p. 1-2), and the 102 rejections

based on Bahr et al. (Functionalization of Carbon Nanotubes by Electrochemical Reduction of Aryl Diazonium Salts: A Bucky Paper Electrode) (p. 3), Tanaka et al. (Solvent-free Organic Synthesis) (p. 3-4), and Haddon et al. (U.S. Patent No. 6,187,823) (p. 4) have been fully considered and are persuasive. The rejections of the claims have been withdrawn.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Tennent et al. (U.S. Patent No. 6,031,711).

Claims 17 and 23 have been rejected.

Claims 1-6, 10-16, 18-22, 24 and 25 have not been rejected under either 35 U.S.C. 102 or 35 U.S.C. 103 because the limitations of these claims are not taught in the reference(s) of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SERENA L. HANOR whose telephone number is (571)270-3593. The examiner can normally be reached on Monday - Thursday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone

Art Unit: 1793

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SLH

/Timothy C Vanoy/

Primary Examiner, Art Unit 1793